

MATH 1314 – College Algebra

Rational Functions Exercises

1. Let $f(x) = \frac{(3x-2)(x+1)}{(x-3)(2x+3)} = \frac{3x^2 + x - 2}{2x^2 - 3x - 9}$.

- (a) Give the domain of $f(x)$.
- (b) Give the coordinates of the x -intercept(s), if any.
- (c) Give the coordinates of the y -intercept, if any.
- (d) Give the equation(s) of the vertical asymptote(s), if any.
- (e) Give the equation of the horizontal or slant asymptote, if any.
- (f) Give the value of x , if any, at which there is a hole in the graph.

2. Let $f(x) = \frac{3(x-2)}{(5x-3)(x+1)} = \frac{3x-6}{5x^2+2x-3}$.

- (a) Give the domain of $f(x)$.
- (b) Give the coordinates of the x -intercept(s), if any.
- (c) Give the coordinates of the y -intercept, if any.
- (d) Give the equation(s) of the vertical asymptote(s), if any.
- (e) Give the equation of the horizontal or slant asymptote, if any.
- (f) Give the value of x , if any, at which there is a hole in the graph.

3. Let $f(x) = \frac{(2x-1)(x+3)}{x-2} = \frac{2x^2+5x-3}{x-2}$.

- (a) Give the domain of $f(x)$.
- (b) Give the coordinates of the x -intercept(s), if any.
- (c) Give the coordinates of the y -intercept, if any.
- (d) Give the equation(s) of the vertical asymptote(s), if any.
- (e) Give the equation of the horizontal or slant asymptote, if any.
- (f) Give the value of x , if any, at which there is a hole in the graph.

4. Let $f(x) = \frac{3(x-2)}{(x+4)(x-2)} = \frac{3x-6}{x^2+2x-8}$.

- (a) Give the domain of $f(x)$.
- (b) Give the coordinates of the x -intercept(s), if any.
- (c) Give the coordinates of the y -intercept, if any.
- (d) Give the equation(s) of the vertical asymptote(s), if any.
- (e) Give the equation of the horizontal or slant asymptote, if any.
- (f) Give the value of x , if any, at which there is a hole in the graph.

Match each equation with its corresponding graph, if any.

_____ 1. $y = \frac{2x^2 - 3x - 2}{x^2 - 2x - 8} = \frac{(x-2)(2x+1)}{(x-4)(x+2)}$

_____ 2. $y = \frac{x^2 - 2x - 8}{2x^2 - 3x - 2} = \frac{(x-4)(x+2)}{(x-2)(2x+1)}$

_____ 3. $y = \frac{2x-2}{x^2-x-6} = \frac{2(x-1)}{(x-3)(x+2)}$

_____ 4. $y = \frac{2x^2 - 18}{x+3} = \frac{2(x+3)(x-3)}{x+3}$

_____ 5. $y = \frac{x^2 + 2x - 3}{x+1} = \frac{(x+3)(x-1)}{x+1}$

